

LISTING OF THE CLAIMS

Claims 2-6, 8, 10, 12-16, 18, 20, 22-26, 28 and 30 are pending. Please amend claims 2-6, 8, 10, 12-16, 18, 20, 22-26, 28 and 30. No claims are added, canceled, or withdrawn.

The following listing of claims replaces all prior versions and listings of claims in the application.

1. (Canceled)

2. (Currently amended) The A method as recited in of claim 5, wherein the queries comprise a well formed natural language question, a keyword, or a phrase.

3. (Currently amended) The A method as recited in of claim 5, wherein the query cluster is used to disambiguate a word or phrase in a query of the queries.

4. (Currently amended) The A method as recited in of claim 5, further comprising determining that the queries are similar based on similar keyword or phrase composition.

5. (Currently amended) A computer-implemented method for clustering queries, the method comprising:

identifying a same document and/or a ~~plurality of~~ similar documents selected by a user in response to a ~~plurality of~~ queries, the similar documents

1 being determined by evaluating a set of selected similar documents chosen
2 responsive to queries p and q of the queries, wherein documents $D_C(.)$ is a subset
3 of a result list $D(.)$ according to the following:

$$4 \quad D_C(p) = \{ d_{p1}, d_{p2}, \dots, d_{pi} \} \subseteq D(p)$$

$$5 \quad D_C(q) = \{ d_{q1}, d_{q2}, \dots, d_{qj} \} \subseteq D(q);$$

6 wherein similarity based on selection of documents is based on:

7 If $D_C(p) \cap D_C(q) = \{ d_{pq1}, d_{pq2}, \dots, d_{pqk} \} \neq \emptyset$, then documents
8 $d_{pq1}, d_{pq2}, \dots, d_{pqk}$ represent a set of common topics of queries p and q , and,

9 whereby the similar documents between queries p and q is determined by
10 $D_C(p) \cap D_C(q)$; and

11 responsive to identifying the same document and/or the similar documents,
12 generating a query cluster to indicate ~~that the~~ queries p and q are similar
13 independent of whether individual ones of the queries p and q comprise similar
14 composition with respect to other ones of the queries.

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16 6. (Currently amended) ~~The~~ A method ~~as recited in~~ of claim 5, further
17 comprising constructing a thesaurus comprising ~~a plurality of~~ synsets, wherein
18 each synset comprises one or more query clusters.

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20 7. (Canceled)

21
22 8. (Currently amended) A computer-implemented method for clustering
23 queries, the method comprising:

24 identifying a same document and/or ~~a plurality of~~ similar documents
25 selected by a user in response to ~~a plurality of~~ queries, by

1 determining the similar documents based on a proportionality of
2 commonly selected individual documents as follows, ~~such that~~:

$$3 \quad \text{similarity}_{\text{single_doc}}(p, q) = \frac{RD(p, q)}{\text{Max}(rd(p), rd(q))},$$

4 wherein $rd(.)$ is the number of clicked documents for a query of the queries, and
5 wherein $RD(p, q)$ is the number of document selections in common; and

6 responsive to identifying the same document and/or the similar documents,
7 generating a query cluster to ~~indicate that the queries are similar~~ identify similar
8 queries of the queries independent of whether individual ones of the similar
9 queries comprise ~~similar~~ analogous composition with respect to other ones of the
10 similar queries.

11
12 9. (Canceled)

10. (Currently amended) A computer-implemented method for clustering queries, the method comprising:

identifying a same document and/or a ~~plurality of~~ similar documents selected by a user in response to a ~~plurality of~~ queries, the similar documents being based on a hierarchical positioning between individual ones of a ~~plurality of~~ documents commonly selected across the queries, wherein $F(d_i, d_j)$ is a lowest common parent node for documents d_i and d_j , wherein $L(x)$ is a level of a node x , wherein L_Total identifies a total number of levels in a hierarchy, and wherein a similarity between two documents is defined as follows:

$$s(d_i, d_j) = \frac{L(F(d_i, d_j)) - 1}{L_Total - 1}, \text{ such that wherein}$$

$s(d_i, d_j) = 1$; and $s(d_i, d_j) = 0$ if $F(d_i, d_j) = \text{root}$; incorporating $s(d_i, d_j)$ into a calculation of query similarity, wherein d_i ($1 \leq i \leq m$) and d_j ($1 \leq j \leq n$) be a set of selected documents for queries p and q respectively as follows such that:

$$\text{similarity}_{\text{hierarchy}}(p, q) = \frac{1}{2} \times \left(\frac{\sum_{i=1}^m (\max_{j=1}^n s(d_i, d_j))}{rd(p)} + \frac{\sum_{j=1}^n (\max_{i=1}^m s(d_i, d_j))}{rd(q)} \right); \text{ and}$$

responsive to identifying the same document and/or the similar documents, generating a query cluster to indicate that the queries p and q are similar independent of whether individual ones of the queries p and q comprise similar composition with respect to other ones of the queries.

11. (Canceled)

1 12. (Currently amended) ~~The Computer-readable media~~ computer-
2 readable medium ~~as recited in~~ of claim 15, wherein the queries comprise a well
3 formed natural language question, a keyword, or a phrase.

4
5 13. (Currently amended) ~~The Computer-readable media~~ computer-
6 readable medium ~~as recited in~~ of claim 15, wherein the query cluster is used to
7 disambiguate a word or phrase in a query of the queries.

8
9 14. (Currently amended) ~~The Computer-readable media~~ computer-
10 readable medium ~~as recited in~~ of claim 15, wherein the ~~computer-executable~~
11 computer-program instructions further comprise instructions for determining that
12 the queries are similar based on similar keyword or phrase composition.

13
14 15. (Currently amended) ~~Computer-readable media~~ A computer-
15 readable medium comprising ~~computer-executable~~ computer-program instructions
16 executable by a processor for identifying similar queries, the ~~computer-executable~~
17 computer-program instructions comprising instructions for:

18 identifying a same document and/or ~~a plurality of~~ similar documents
19 selected by a user in response to ~~a plurality of~~ queries, the similar documents
20 being determined by evaluating a set of selected similar documents chosen
21 responsive to queries p and q of the queries, wherein documents $D_C(.)$ is a subset
22 of a result list $D(.)$ according to the following:

$$D_C(p) = \{ d_{p1}, d_{p2}, \dots, d_{pi} \} \subseteq D(p)$$

$$D_C(q) = \{ d_{q1}, d_{q2}, \dots, d_{qj} \} \subseteq D(q);$$

wherein similarity based on selection of documents is based on:

If $D_C(p) \cap D_C(q) = \{ d_{pq1}, d_{pq2}, \dots, d_{pqk} \} \neq \emptyset$, then documents $d_{pq1}, d_{pq2}, \dots, d_{pqk}$ represent a set of common topics of queries p and q , and,

whereby the similar documents between queries p and q is determined by $D_C(p) \cap D_C(q)$; and

responsive to identifying the same document and/or the similar documents, generating a query cluster to indicate that the queries are similar independent of whether individual ones of the queries comprise similar composition with respect to other ones of the queries.

16. (Currently amended) The Computer-readable media computer-readable medium as recited in of claim 15, wherein the ~~computer-executable~~ computer-program instructions further comprise instructions for constructing a thesaurus comprising a plurality of synsets, wherein each synset comprises one or more query clusters.

17. (Canceled)

1 18. (Currently amended) ~~Computer-readable media~~ A computer-
2 readable medium comprising ~~computer-executable~~ computer-program instructions
3 executable by a processor for identifying similar queries, the ~~computer-executable~~
4 computer-program instructions comprising instructions for:

5 identifying a same document and/or ~~a plurality of~~ similar documents
6 selected by a user in response to ~~a plurality of~~ queries, the similar documents
7 being determined based on a proportionality of commonly selected individual
8 documents as follows, ~~such that~~:

$$\text{similarity}_{\text{single_doc}}(p, q) = \frac{RD(p, q)}{\text{Max}(rd(p), rd(q))},$$

10 wherein $rd(.)$ is the number of clicked documents for a query of the queries, and
11 wherein $RD(p, q)$ is the number of document selections in common; and

12 responsive to identifying the same document and/or the similar documents,
13 generating a query cluster to indicate ~~that the~~ queries are similar independent of
14 whether individual ones of the queries comprise similar composition with respect
15 to other ones of the queries.

17 19. (Canceled)

20. (Currently amended) ~~Computer-readable media~~ A computer-readable medium comprising ~~computer-executable computer-program~~ instructions executable by a processor for identifying similar queries, the ~~computer-executable computer-program~~ instructions comprising instructions for:

identifying a same document and/or ~~a plurality of~~ similar documents selected by a user in response to ~~a plurality of~~ queries, the similar documents being based on a hierarchical positioning between individual ones of ~~a plurality of~~ documents commonly selected across the queries, wherein $F(d_i, d_j)$ is a lowest common parent node for documents d_i and d_j , wherein $L(x)$ is a level of a node x , wherein L_Total identifies a total number of levels in a hierarchy, and wherein a similarity between two documents is defined as follows:

$$s(d_i, d_j) = \frac{L(F(d_i, d_j)) - 1}{L_Total - 1}, \text{ such that wherein}$$

$s(d_i, d_j) = 1$; and $s(d_i, d_j) = 0$ if $F(d_i, d_j) = \text{root}$; incorporating $s(d_i, d_j)$ into a calculation of query similarity, wherein. d_i ($1 \leq i \leq m$) and d_j ($1 \leq j \leq n$) be a set of selected documents for queries p and q respectively as follows ~~such that~~:

$$\text{similarity}_{\text{hierarchy}}(p, q) = \frac{1}{2} \times \left(\frac{\sum_{i=1}^m (\max_{j=1}^n s(d_i, d_j))}{rd(p)} + \frac{\sum_{j=1}^n (\max_{i=1}^m s(d_i, d_j))}{rd(q)} \right); \text{ and}$$

responsive to identifying the same document and/or the similar documents, generating a query cluster to indicate ~~that the similar queries are similar~~ independent of whether individual ones of the similar queries comprise similar composition with respect to other ones of the similar queries.

1 21. (Canceled)

2
3 22. (Currently amended) A The computing device ~~as recited in~~ of claim
4 25, wherein the queries comprise a well formed natural language question, a
5 keyword, or a phrase.

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7 23. (Currently amended) A The computing device ~~as recited in~~ of claim
8 25, wherein the query cluster is used to disambiguate a word or phrase in a query
9 of the queries.

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11 24. (Currently amended) A The computing device ~~as recited in~~ of claim
12 25, wherein the computer-executable instructions further comprise instructions for
13 determining that the queries are similar based on similar keyword or phrase
14 composition.

15
16 25. (Currently amended) A computing device comprising:
17 a processor coupled to a memory, the memory comprising computer
18 executable instructions, the processor being configured to fetch and execute the
19 computer-executable instructions for:

20 identifying a same document and/or ~~a plurality of~~ similar documents
21 selected by a user in response to ~~a plurality of~~ queries, the similar documents
22 being determined by evaluating a set of selected similar documents chosen
23 responsive to queries p and q of the queries, wherein documents $D_C(.)$ is a subset
24 of a result list $D(.)$ according to the following:
25

$$D_C(p) = \{ d_{p1}, d_{p2}, \dots, d_{pi} \} \subseteq D(p)$$

$$D_C(q) = \{ d_{q1}, d_{q2}, \dots, d_{qj} \} \subseteq D(q);$$

wherein similarity based on selection of documents is based on:

If $D_C(p) \cap D_C(q) = \{ d_{pq1}, d_{pq2}, \dots, d_{pqk} \} \neq \emptyset$, then documents $d_{pq1}, d_{pq2}, \dots, d_{pqk}$ represent a set of common topics of queries p and q , and,

whereby the similar documents between queries p and q is determined by $D_C(p) \cap D_C(q)$; and

responsive to identifying the same document and/or the similar documents, generating a query cluster to indicate that the queries are similar independent of whether individual ones of the queries comprise similar composition with respect to other ones of the queries.

26. (Currently amended) A The computing device as ~~recited in~~ of claim 25, wherein the computer-executable instructions further comprise instructions for constructing a thesaurus comprising ~~a plurality of~~ synsets, wherein each synset comprises one or more query clusters.

27. (Canceled)

28. (Currently amended) A computing device comprising :
a processor coupled to a memory, the memory comprising computer executable instructions, the processor being configured to fetch and execute the computer-executable instructions for:

identifying a same document and/or ~~a plurality of~~ similar documents selected by a user in response to ~~a plurality of~~ queries, the similar documents

1 being determined based on a proportionality of commonly selected individual
2 documents as follows, ~~such that~~:

$$3 \quad \text{similarity}_{\text{single_doc}}(p, q) = \frac{RD(p, q)}{\text{Max}(rd(p), rd(q))},$$

4 wherein $rd(.)$ is the number of clicked documents for a query of the queries, and
5 wherein $RD(p, q)$ is the number of document selections in common; and

6 responsive to identifying the same document and/or the similar
7 documents, generating a query cluster to indicate ~~that the~~ similar queries ~~are~~
8 ~~similar~~ independent of whether individual ones of the similar queries comprise
9 similar composition with respect to other ones of the similar queries.
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11 **29.** (Canceled)
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30. (Currently amended) A computing device ~~comprising~~: comprising:
a processor coupled to a memory, the memory comprising computer
executable instructions, the processor being configured to fetch and execute the
computer-executable instructions for:

identifying a same document and/or ~~a plurality of~~ similar documents
selected by a user in response to ~~a plurality of~~ queries, the similar documents
being based on a hierarchical positioning between individual ones of ~~a plurality of~~
documents commonly selected across the queries, wherein $F(d_i, d_j)$ is a lowest
common parent node for documents d_i and d_j , wherein $L(x)$ is a level of a node x ,
wherein L_Total identifies a total number of levels in a hierarchy, and wherein a
similarity between two documents is defined as follows:

$$s(d_i, d_j) = \frac{L(F(d_i, d_j)) - 1}{L_Total - 1}, \text{ such that wherein}$$

$s(d_i, d_i) = 1$; and $s(d_i, d_j) = 0$ if $F(d_i, d_j) = \text{root}$; incorporating $s(d_i, d_j)$
into a calculation of query similarity, wherein. (Original) d_i ($1 \leq i \leq m$) and d_j ($1 \leq j \leq$
 n) be a set of selected documents for queries p and q respectively as follows ~~such~~
that:

$$\text{similarity}_{\text{hierarchy}}(p, q) = \frac{1}{2} \times \left(\frac{\sum_{i=1}^m (\max_{j=1}^n s(d_i, d_j))}{rd(p)} + \frac{\sum_{j=1}^n (\max_{i=1}^m s(d_i, d_j))}{rd(q)} \right); \text{ and}$$

responsive to identifying the same document and/or the similar
documents, generating a query cluster to indicate ~~that the~~ similar queries are
~~similar~~ independent of whether individual ones of the similar queries comprise
similar composition with respect to other ones of the similar queries.